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CEMP-C

Subject: Network Analysis, Standard Data Exchange Format

Applicability: INFORMATION

1. Reference: Construction Bulletin 95-17, 21 July 1995 same subject. The purpose of this CB is to update CB 95-17 and to provide information on using the new Primavera export routine.
2. Engineer Regulation 1-1-11 was published on 15 June 1995. The appendix in this regulation contains the Standard Data Exchange Format specification. Some new schedule vendors and products now support the format. The vendors who currently support the SDEF are as follow:

VENDOR/SYSTEM	VERSION SUPPORTS SDEF	POINT OF CONTACT
Aldergraph Systems Aldergraph	Version 5.2 Or later	Mr. Leon Alderfer (713) 467-8500
DLWcpm	Any version Jan. 97 or later	Mr. David Webber (972) 690-1954
Welcome Software Tech. Open Plan	Version 5.1 Or later	Mr. Chris Jenson (713) 558-0514
Pinnell-Busch Engr PMS-80	Version 6.40 Or later	Mr. Perry Smith (503) 293-6280
Adv. Proj. Approach PPMS-30,000	Version 4.02 Or later	Mr. Justin Smith (214) 929-1877
Primavera Systems PRIMAVERA	Version 2.0 For Windows	Any support Tech. (610) 668-3030


CEMP-CE

SUBJECT: Network Analysis, Standard Data Exchange Format

3. CERL has just recently tested the export routine developed for use with Primavera Project Planner (version 2.0 for Windows). This routine (P3SDEF) complies with the SDEF provided the guidelines in the attached report and in program help files are followed precisely. Also attached is a Contractor's Guide to the Standard Data Exchange Format which has been developed to assist districts and field offices in familiarizing contractors with the requirements and use of the SDEF. This will become particularly important in the transfer of contractor's schedule information into our Resident Management System.

4. If there are questions about the enclosed material or for a copy of the SDEF checker program which will check the contractor's input disc data contact Bill East at CERL, (217) 373-6710. Contact in HQUSACE is Stan Green, (202) 761-0206.

Encls


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Directorate of Military Programs

SDEF Export for Primavera (v. 2.0 for Windows) Test Report

EXECUTIVE SUMMARY:

The export routine, P3SDEF (dated 5 March 1997), provided by Primavera Systems, Inc. for use with their Primavera Project Planner (version 2.0 for Windows) was tested and complies with the SDEF, provided the guidelines described in this report and in program help files are followed precisely.

Objective: The purpose of this test report is to provide the results of the recent test of export software provided by Primavera Systems, Inc. This software translates scheduling data for a project contained in Primavera Project Scheduler (version 2.0 for Windows) into a data file that complies with the Standard Data Exchange Format (SDEF). For the remainder of this report the export routine being tested will be referred to by the name "P3SDEF."

References: The use of the SDEF is identified in Corps of Engineers, Guide Specifications, CEGS 01310 - "Project Schedule." Details of the format may be found in Appendix A of Engineering Regulation, ER 1-1-11 - "Network Analysis Systems." Previous test information regarding Primavera Systems' products found in Appendix H, "Primavera, Version 5.1 (DOS)," in the USA-CERL Technical Report, "The Standard Data Exchange Format for Critical Path Method Scheduling" (TR-95/40) is supplemented by the information contained in this test report.

Obtaining the Export Program: The beta P3SDEF was downloaded from Primavera Systems' Internet File Transfer Protocol (FTP) site in March 1997. The address for this site was ftp.primavera.com. The public login name for the site was "anonymous". The password for the site was a persons individual Internet e-mail address. The file "p3sdef.exe" was contained in the /pub/download/ directory. The date of the file tested in this report was 5 March 97.

Future readers should contact P3 technical support directly to determine if there have been any changes in Primavera Systems' distribution mechanisms or changes to the FTP service described above. It is expected that P3SDEF will be initially distributed via 3.5" disks. After April 97, the P3SDEF program should also be available from the company's web site.

Export Program Requirements: To use P3SDEF the contractor must have Primavera for Windows (version 2.0) or later already installed on their systems. The system should have a minimum of 8MB of RAM. The P3SDEF program requires approximately 600KB of dedicated hard drive space. P3SDEF was tested under the Windows NT, version 4.0, operating system. P3SDEF also run under the Windows 3.11 and Windows 95 operating systems.

Installing of the Export Program: The “readme.txt” file contained in the “p3sdef.exe” download program gives specific installation instructions. These instructions should be carefully reviewed for any changes to information contained in this test report.

Creating SDEF Compliant Projects: When developing projects for export using P3SDEF, there are a number of items to be considered. Contractors and consultants should begin by reviewing the help file provided by Primavera Systems that should contain the latest information on these and other important SDEF issues.

WARNING! The items described below, as well as all the items contained in the P3SDEF help file, must be incorporated into the project when the project is first created, otherwise the contractor may be unable to correctly produce an SDEF file.

Project Considerations:

Project duration units must be set to “daily”.

Project descriptions are truncated after 30 characters.

Activity Considerations:

Exporting activity code information will be, typically, the only problem contractors have when using P3SDEF. Failure of the contractor to update the default activity code dictionary, in accordance with published information from Primavera, will result in the export of NONE of the contractor’s activity coding to the SDEF file.

The “missing” data may come as a big surprise to those contractors who entered several thousand activities without correctly creating the activity coding dictionaries.

The only way for activity codes to be properly exported is for the activity coding dictionary to match the dictionary provided by the Primavera documentation. The distribution release of P3SDEF will contain specific instructions for contractors as to how to update the activity coding dictionaries. These instructions were not provided in the beta help files tested.

The table below provides the activity coding dictionary that was successfully used during the test of P3SDEF to export activity codes. This table is provided for information only. Readers should follow the activity coding instructions provided with the P3SDEF program.

Position	Name	Size	SDEF Code Field
1	WORK	3	Workers per Day
2	RESP	4	Responsibility Code
3	AREA	4	Work Area Code
4	MOD	6	Mod/Claim Code
5	BID	6	Bit Item Code
6	PHAS	2	Phase of Work Code
7	CTGY	1	Category of Work Code
8	FEA1	10	Feature of work (1 of 3)
9	FEA2	10	Feature of work (2 of 3)
10	FEA3	10	Feature of work (3 of 3)

If a contractor fails to correctly create the activity coding scheme prior to adding activities, there is a method to export coding data, shuffle the information, and re-import the codes to a project that has a correctly specified activity coding scheme. Specific instructions for this translation technique is beyond the scope of the current test report but may be obtained directly from Primavera. Instructions regarding this translation process will be included in the distribution release of P3SDEF.

Cost Considerations:

Activity Detail & Bid Item Coding

The primary problem translating cost information from P3 to SDEF will not be an issue related to the P3SDEF program, but one of activity definition. The SDEF requires that a bid item code be included for every activity that has a value. The greater the detail in bid items, the more activities that must be included in the schedule. This requirement of one bid item per activity may cause problems for some contractors.

Problems arise when bid items are defined in terms of very detailed construction sub-activities. For example, instead of a bid item called "cast-in-place concrete," the specification requires separate bid items for re-bar, concrete, and form work. With the

more detailed bid items comes a requirements to provide three times the number of activities that would normally be included in the schedule for concrete.

To insure that a reasonable level of activity detail is being included in the schedule, it is crucial for Corps offices to consolidate bid items that are too detailed, from a scheduling point of view.

Multiple Cost Codes

According to P3SDEF documentation the export routine sums all cost and resource items into a single activity cost and earned value to date. During the test of the P3SDEF program only one cost resource was tested. This resource was called "Cost." Cost fields that successfully produced SDEF cost data were "Budgeted Cost" and "Actual to Date."

In general, when developing schedules for Corps jobs it is recommended that contractors do not use complex resource coding schemes since these additional data fields greatly increase the complexity of the administrative cost of scheduling. Furthermore, complex coding schemes will not transfer to other project stakeholders, using different scheduling or project management systems, via. the SDEF.

Fiscal Activity Start

There are no restrictions, in P3, to require contractors to add a actual start date for activities that have reported earnings. The SDEF requires that if an activity has posted earnings, then there must be an actual start date and a remaining duration. This is a schedule usage issue that should be reviewed during contractor submissions of SDEF data disks.

Fiscal Activity Completion

There are no restrictions, in P3, to require contractors to add an activity actual end date for activities that are reporting 100% complete based on cost. The SDEF requires that if a contractor has fiscally completed a project, then there must be an actual finish date. This is a scheduling usage issue that should be reviewed during contractor submissions of SDEF data disks.

Unit Cost Consideration:

The current implementation of unit cost data is not widely supported by scheduling vendors who support all other aspects of the SDEF. As a result, unit cost data has not been reviewed as part of this, or previous, SDEF tests. Schedulers who need to transmit unit cost data should refer to P3SDEF technical support for additional information.

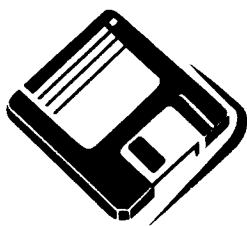
A full evaluation of unit cost items and resource coding issues has been proposed by Primavera. It is recommended that a future version of the SDEF be considered that would allow multiple resource records be assigned to activities. CERL is working with a number of industry and trade groups to properly expand the scope of the SDEF to include resource, and other information. Readers comments and suggestions on these issues would be welcome.

Using the Export Program: The beta export program has been incorporated into the menu structure of the P3 program itself. This is a significant improvement over the earlier SDEF export routine. Instructions for operating the SDEF export routine are provided by Primavera Systems.

Technical Support: The first location to try to get help is from Primavera Systems. Their technical support number is 610-668-3030. There will be one Technical Support person who will be trained in the use of the P3SDEF program.

The person responsible for P3SDEF testing was Mr. John Salvado. Mr. Salvado may also be contacted by fax at 610-617-7575 or via. e-mail at jsalvado@primavera.com.

SDEF Questions: For questions on the Standard Data Exchange Form at itself, please call Mr. Bill East at 217-373-6710. Mr. East may also be contacted by fax at 217-373-6724 or via. e-mail at b-east@cecer.army.mil.



A Contractor's Guide to the Standard Data Exchange Format

Now that you've got that Corps' job it's time to review the paperwork required. One of the recent changes in Corps' requirements has to do with the progress schedule. Current Corps' guide specifications call for progress schedules to be submitted on a data disk according to the Standard Data Exchange Format (SDEF). The SDEF is produced directly from many popular commercial scheduling programs so you have to buy any additional software. With the SDEF, the progress schedule can become more than just paperwork - - it can become your ticket to getting paid faster, getting changes resolved more quickly and identification possible holdups on the job before it's too late to recover.

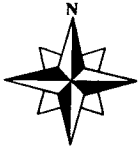
The following guidelines are provided to make sure that the data you submit is correct. You should ask your scheduler, or consultant, to go over these points with the local Corps office prior to submitting the initial progress schedule.

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Starting and Ending the Job

When showing the start and end dates on the jobs, there are a variety of ways that scheduling systems allow you to use. To get consistent result regardless of scheduling system used, and to make sure that the Corps office gets the same result that you do, please follow the guidelines below.



- The description of the first activity should be “NTP Acknowledged”
- Add an early start constraint date to this first activity
- The description of the last activity should be “Finish Job”
- Add a late finish constraint to the last activity

Using Calendars

While many calendars can be supported with most scheduling systems, it is recommended that the following guidelines be followed for most projects:



- The primary schedule should be a 5-day work week (Monday through Friday) schedule
- Federal and other holiday should be assigned to the 5-day schedule
- The second schedule should be a 7-day work week schedule
- No holidays should be used on the 7-day schedule

Assigning Responsibility Codes

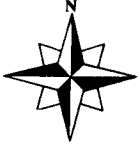
To be able to report on how various subcontractors and general contractor activities are progressing each activity will have a responsibility code. One of Murphy's Laws of project management is, “The more people responsible for something, the less likely that something is to be accomplished.” Taking this one of Murphy's many “laws” to heart, each activity may only have a single subcontractor responsibility code. A task containing more than one sub or a sub and general, should be split until only one company is responsible for the task. Use the following guidelines in your schedule:



- Every activities must be assigned one responsibility code
- Each subcontractors will have a unique responsibility code
- Codes for sub contractors, not yet awarded, may be listed by type of work
- All government activities, including GFE/M, will be coded “GOVT”
- Activities not specifically assigned will be assigned to the general contractor.

Adding Definable Features of Work

Your Quality Control Plan requires that you organize the project according to definable features of work. The definable features of work are assigned to specific activities in the schedule so that preliminary, initial and follow-up inspections may be scheduled.



- All activities must have a definable feature of work code
- You may use the code "Precon" for non-work activities starting the project
- The Features of Work in your Q.C. Plan and schedule must exactly match

Physical vs. Fiscal Completion

Your payment is based upon earnings on specific schedule activities. During a project some activities may have started but not earned very much. Other activities may have only started but earned the majority of their value. To allow you to get paid as quickly as possible for work in-place, the SDEF allows you to have a separate value for remaining duration and for earnings to date. To insure that you correctly provide both pieces of information during an update be sure that you follow the guidelines below.



- Every activity with earnings must have an actual start date
- In-progress activities must have an actual start date, and a remaining duration
- Every activity that is 100% complete in cost must have a finish date

Reported Earnings as Basis for Payment

Your payment is based upon earnings on specific schedule activities. Adding up all the activities to get the total contract amount is the first step to making sure your invoice will be accepted. Next, the sum of the value of activities in a each bid item must equal the value of that bid item. Note that a bid item will be created for contract modification that adds to the cost of the overall project. The sum of all activities identified with the unique bid item for the modification must equal the total value of the modification.



- Every activity must have a bid item code
- The sum of the value of all activities must equal the total contract amount
- The sum of the value for all activities must be equal to bid item amounts
- Contract modifications have their own bid item value

Getting Paid for Equipment/Delivery Activities

The best way to get paid for delivery activities is to add the cost of the equipment to the delivery activity discussed in the previous section. While non-construction activities, typically, should not have cost associated with them, delivery of major equipment or materials is an exception. To be paid for materials on site the following steps should be followed:



- Delivery activities that you want to be paid for must be in the schedule
- You must provide a paid invoice for the equipment or materials

Submitting Change Estimates

The schedule is the best tool for you to quickly resolve the time impact of changes over two weeks in duration with the Corps' office. In the past you may have only submitted a cost estimate of the extra work to be accomplished. To determine if a time extension should be granted do the following:



- Update the schedule to the point when the change(s) occurred
- Add or edit the effected activities, list the activities on your cover letter
- Add a temporary new bid item code
- Set the bid item for each effected activity to the temporary bid item code
- Recalculate the schedule
- Submit the resulting schedule to the Corps for evaluation

Showing Project Phases

Many projects are organized in phases. If your project has phasing requirements, then you may need to show these in your schedule. Adding the project phases you will be able to see the status of each of the phases without needing to look through a lot of paper reports. Since it's likely that some phases will be ahead of schedule and some phases could be "cutting it close," you will also want to make sure that the start and finish dates for each of the phases is included in your schedule. Here are some key points when setting up the project phases in your schedule.



- Use a unique Phase of Work code for each phase
- Assign overall activities to phase of work code = "0"
- The first activity of each phase should have an start date constraint
- The last activity in each phase should have a finish date constraint

Showing Project Work Areas

Many projects are organized in work areas. If your project has repeated work areas, then you may need to show these in your schedule. Adding the project phases you will be able to see the status of each of the phases without needing to look through a lot of paper reports. Also with work areas you may develop resource profiles that show your most productive use of workers, without the need for complicated resource analysis routines built into commercial scheduling software.



- Use a unique work area code for each definable work area
- Assign overall activities to work area code = "0"
- The first activity of each work area may have an early start date constraint
- The last activity of each work area may have a late finish date constraint

Adding Submittal, Approval, and Delivery Activities

Most submittals are tracked in the submittal register, however, some important submittals should be included directly in your schedule. You can probably already guess which submittals are likely to cause problems. These are the ones that should be included in the schedule as individual activities.



- Procurement activities for possible problem items should be included
- All procurement large equipment should be included
- Use three separate activities: a submittal, approval, and delivery activity
- The Resident Engineer should advise you as to which Category of Work code to use for these activities. For example, you may be able to set the category of work code to "S" for All Submittal Activities, "A" for approvals, and "D" for delivery activities.

Using the Workers Per Day Code

While not usually required on smaller projects, on larger projects the workers per day code may provide some useful benefits. Using an activity code for the workers per day information, rather than using detailed resource coding allowed by some commercial software systems, provides many of the benefits of a detailed resource analysis without the work often required to perform resource analysis. For example you may be able to identify sequencing that moves too many workers into a given work area. You may also be able to find more efficient ways of scheduling workers by reporting on the "work flow" as individual responsibilities move through various project work areas or phases of work.



- If workers per day is used assign a worker per day amount to every activity
- All activities without any workers per day must have a value of "0"
- The combination of responsibility code and workers per day is the most effective use of this data. Make sure that the level of detail for responsibility codes allows you to track crews through various work areas of the project.

Submitting the Data Disk

Rather than require you to submit a data disk in a format that may not be compatible with the system that you currently use the Corps requires that scheduling data be provided in a non-proprietary data disk format, the Standard Data Exchange Format (SDEF). Not only does the SDEF allow data transfer between scheduling systems, it also allows you to directly import data into the Corps' Resident Management System.

Getting the Right Software

The two problem contractors have when trying to make the SDEF disk is that the schedule software being used is: (1) not the correct version and (2) not correctly set-up. The first step in getting a correct schedule data disk is to get the appropriate version of the software and export program. Next, be sure that the vendor provides the supplementary instruction booklet or updated users. The list below provides points of contact for software that has successfully been tested against the SDEF.

<i>Product</i>	<i>Point of Contact</i>	<i>Phone Number</i>
AlderGraf	Mr. Leon Alderfer	(713) 467-8500
DLWcpm	Mr. David Webber	(972) 690-1954
Open Plan	Mr. Chris Jenson	(713) 558-0514
PMS-80	Mr. Perry Smith	(503) 293-6280
PPMS	Mr. Justin Smith	(214) 929-1877
Primavera (v 2.0)	Any Support Technician	(610) 668-3030

Setting up the Software

Once you have software that supports the SDEF using the export routines is easy once you get the hang of it. If you would like to make suggestions to vendors, about improvements to their SDEF programs, just pick up the phone and give them a call. SDEF export routines have been written directly into the list of tested software. Each software system vendor also provides instructions for how and where to enter data to insure that the information is correctly included in the SDEF file.

The most frequent problem contractors encounter when producing SDEF data files are incorrectly configured activity coding schemes and the use of more than one bit item per activity. Activity coding schemes must be configured exactly to match the requirements of the SDEF. Most vendors provide sample projects that you may copy and rename. Other vendors require that you edit the activity coding dictionary to create the correct set of codes. The first thing you should do, before adding a single activity to your schedule, is to make sure that the activity codes are correctly configured.

Another problem that has been encountered is that each activity may only contain one bid item. Apparent problems may arise with contracts containing detailed bid item schedules. In these projects, schedulers may need to add additional activities to insure that only one bid item is applied to each activity.

Finally, you will want to check with the Corps office to make sure that both systems use compatible scheduling methods. Currently, the SDEF supports both arrow and precedence scheduling methods, however, the same cannot be said for all of the software that is able to produce SDEF compliant data files.

Conclusions

Transferring schedule data without requiring you to buy and learn new software to suit each project owner will be a great savings to you. Once the data is provided to the Corps, you may be paid more quickly. You will also be able to easily justify all time extensions, submit the request for change and get on with the job rather than waiting until the end of the job and submitting the single "monster claim."

